

No. 664,253.

Patented Dec. 18, 1900.

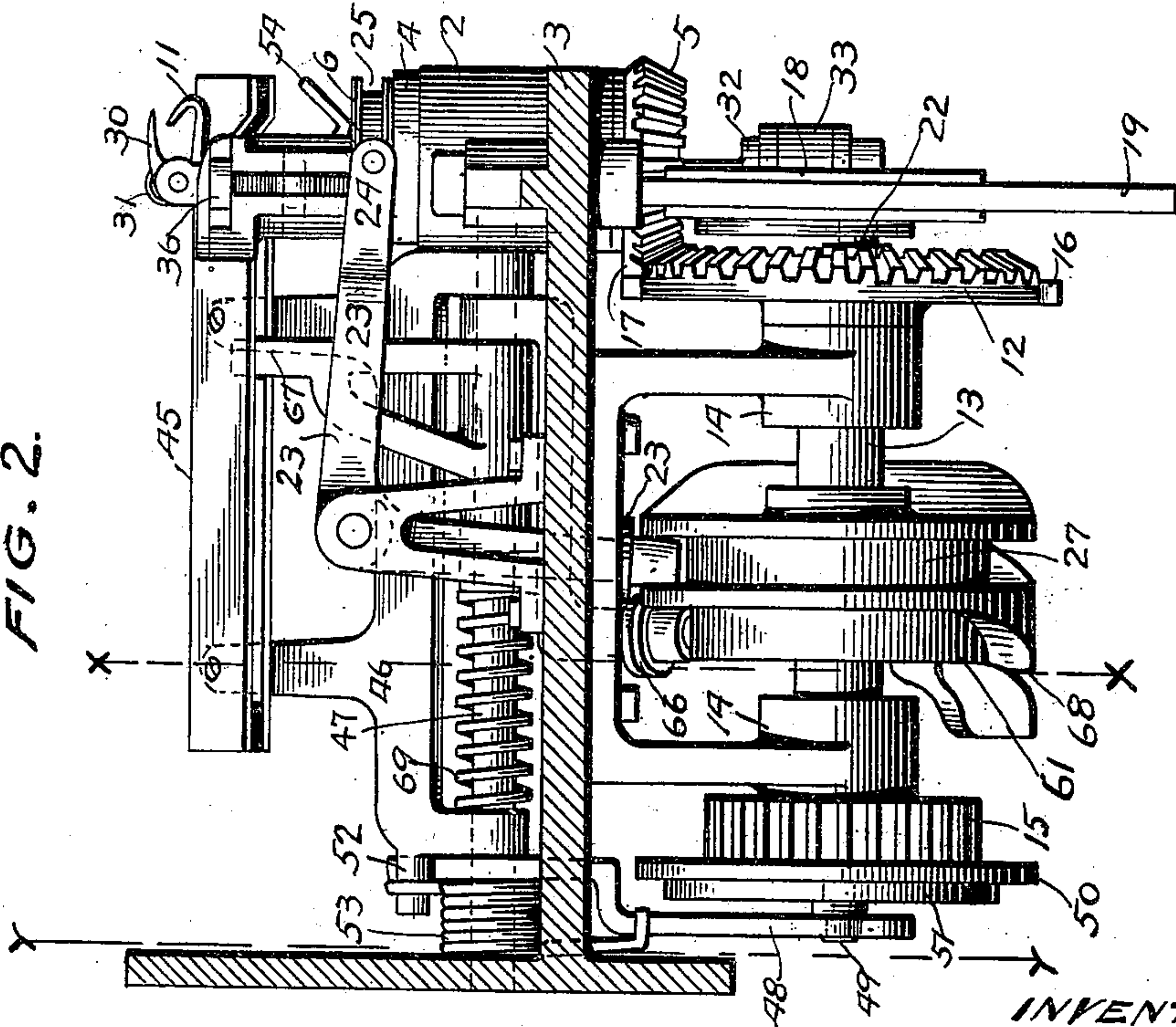
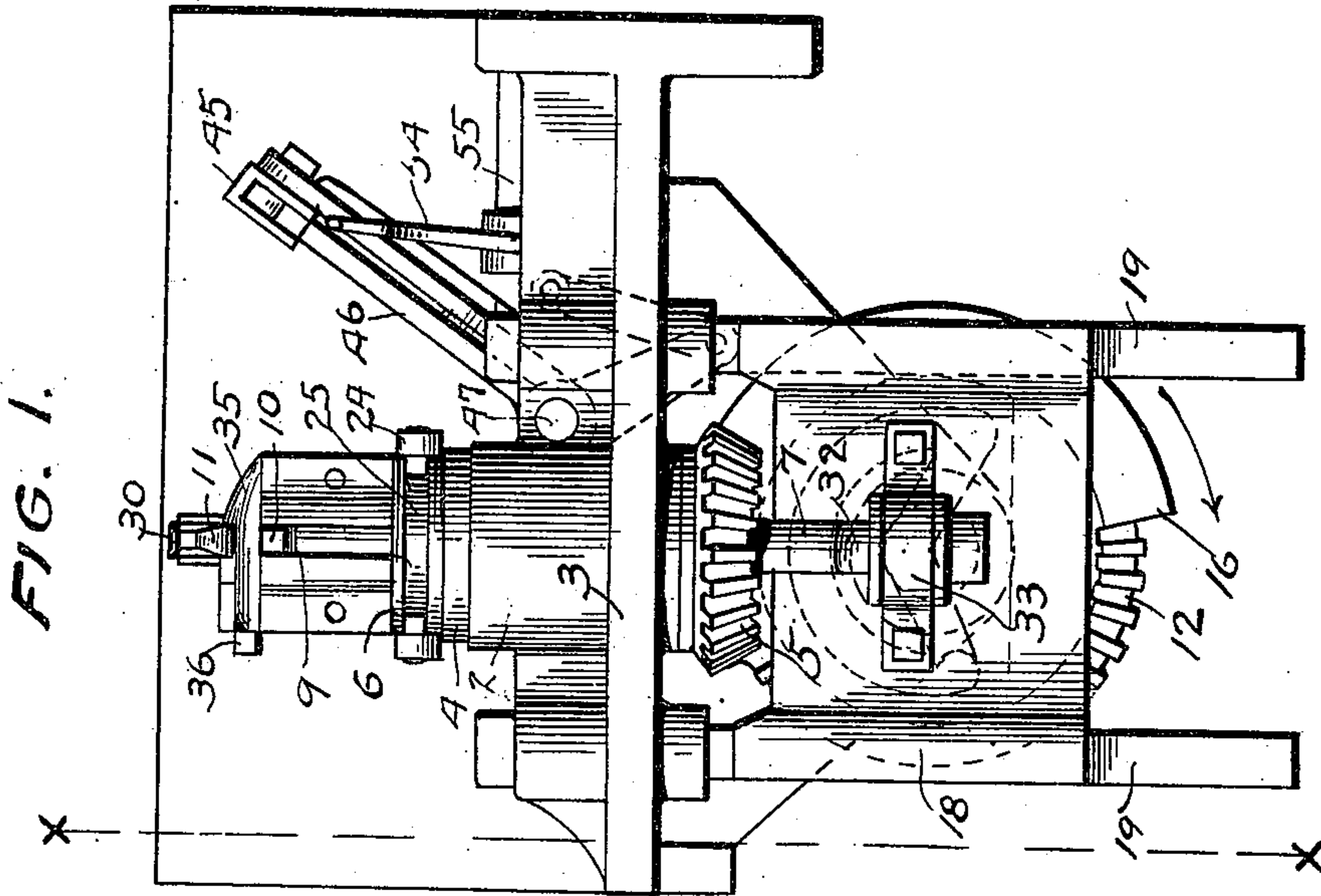
A. E. GAGNON & H. JONCAS.

KNOTTER FOR BINDERS.

(Application filed July 3, 1897.)

(No Model.)

9 Sheets—Sheet 1.



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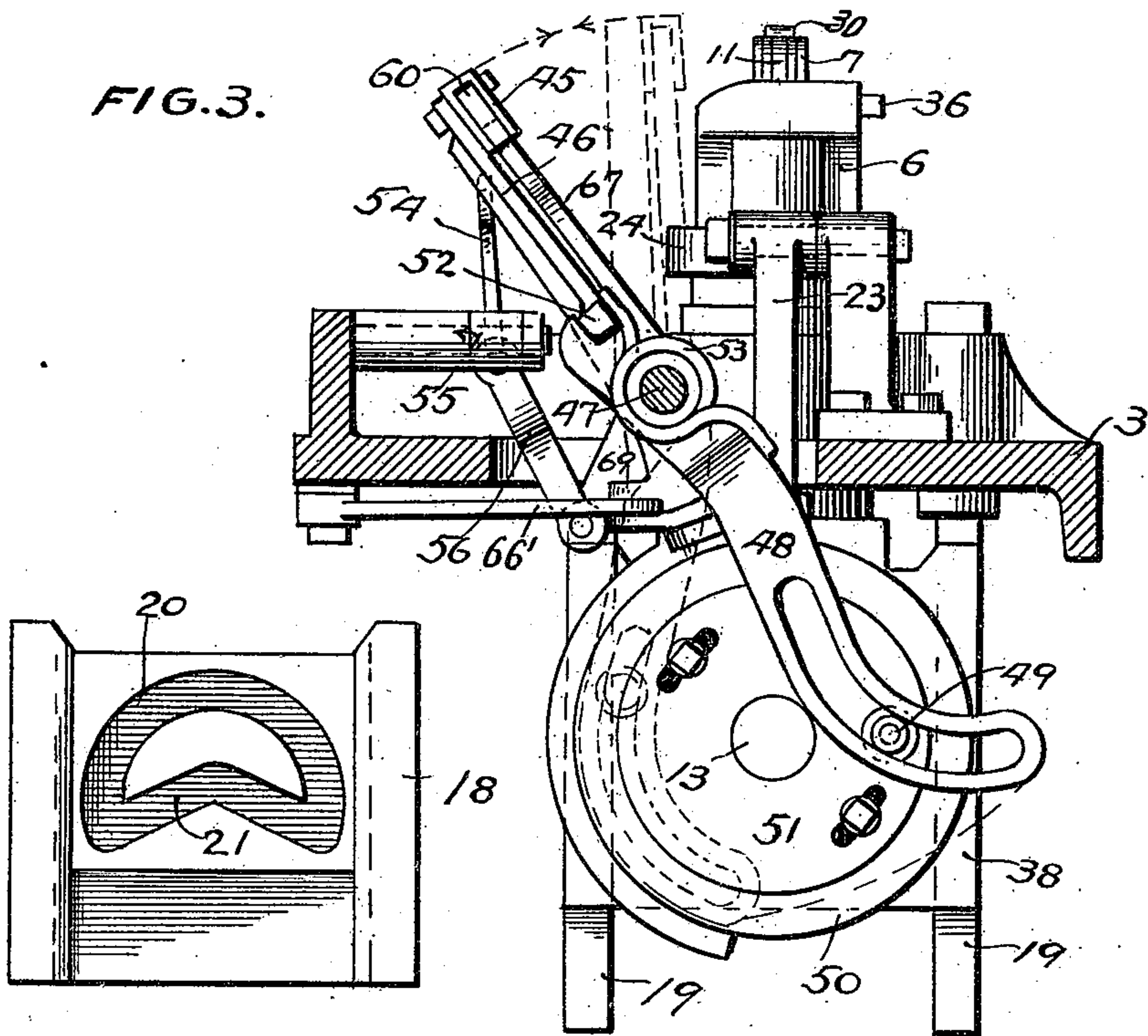
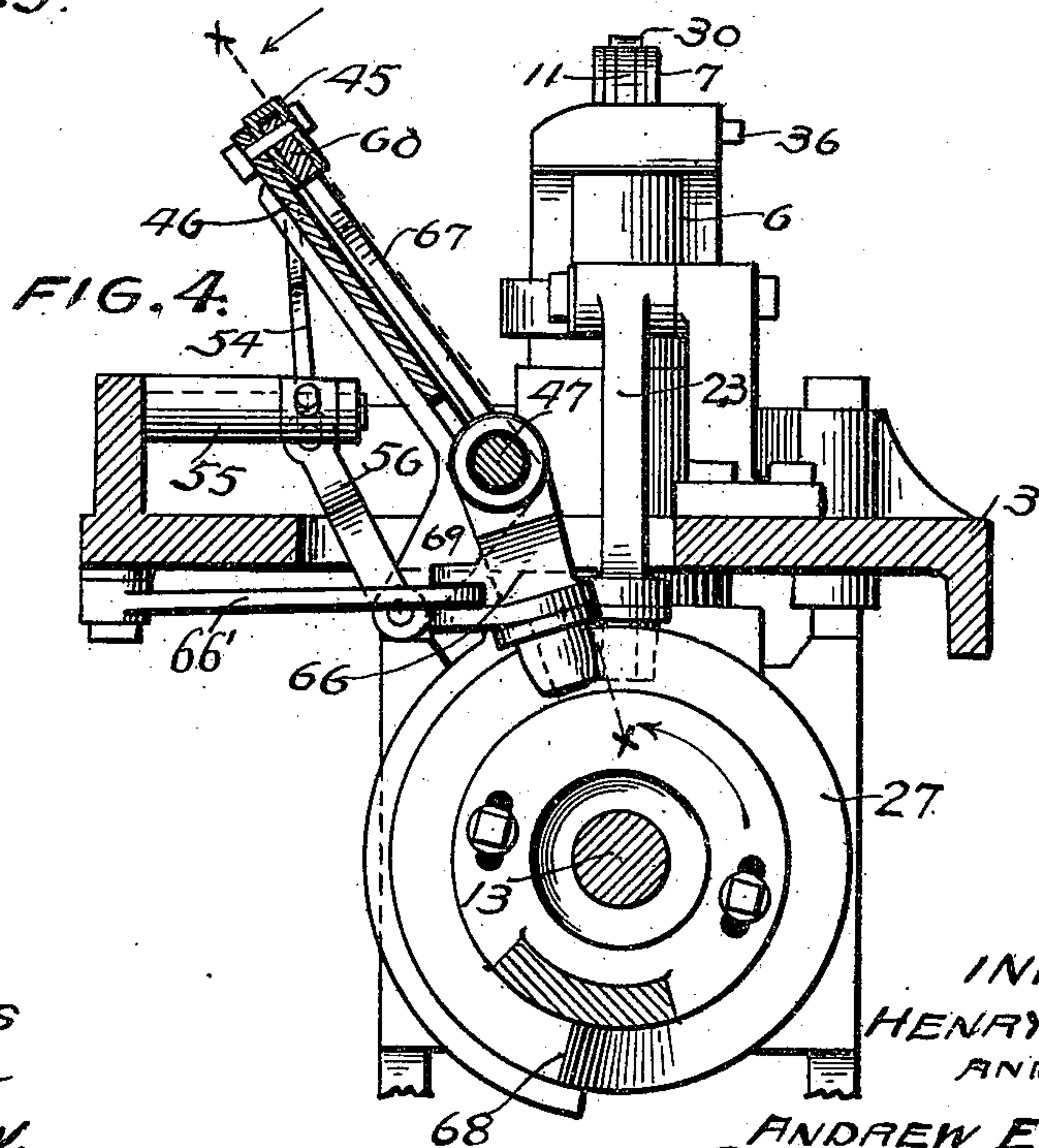


FIG. 5.



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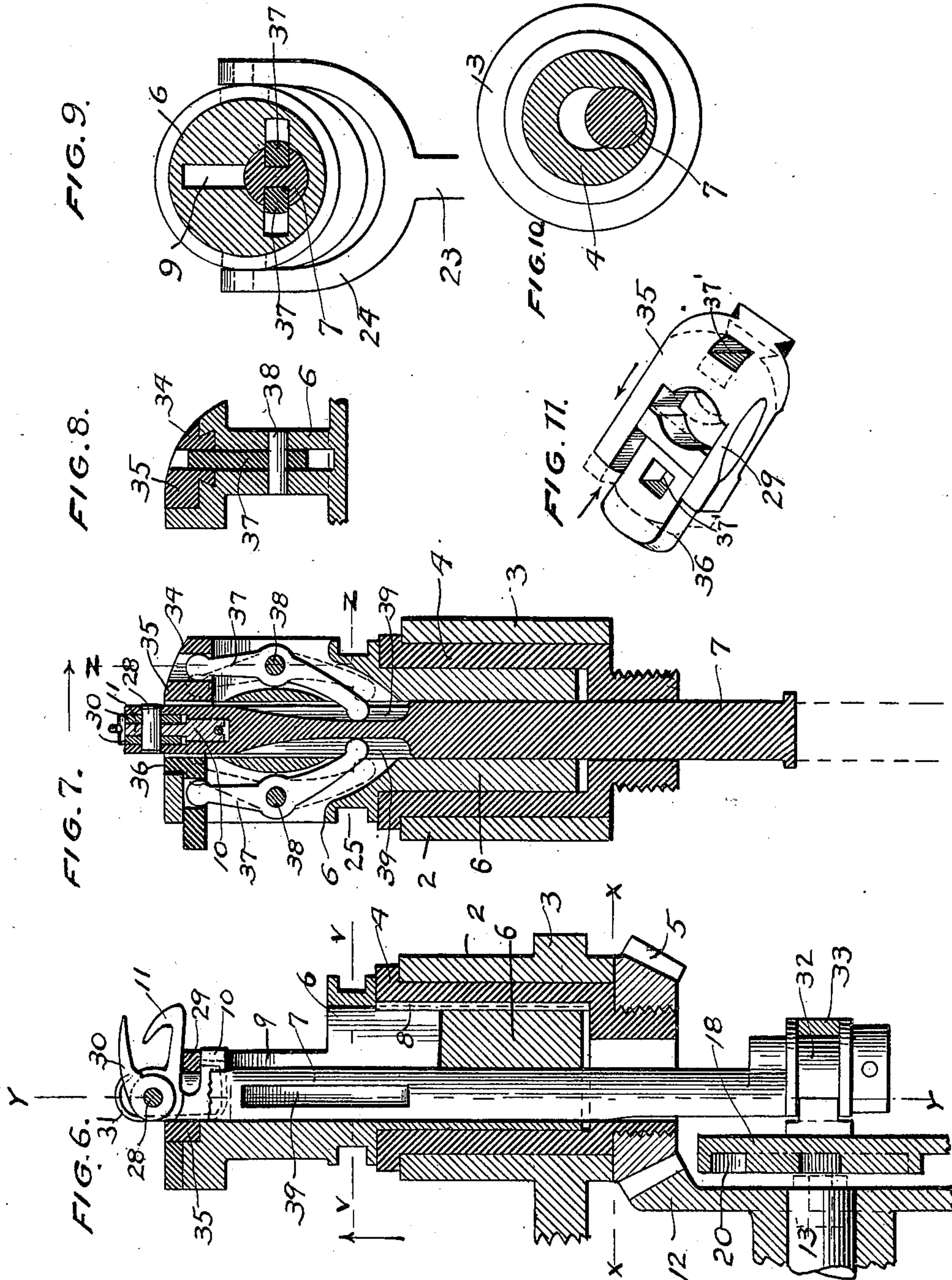
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6 Sheets—Sheet 3.



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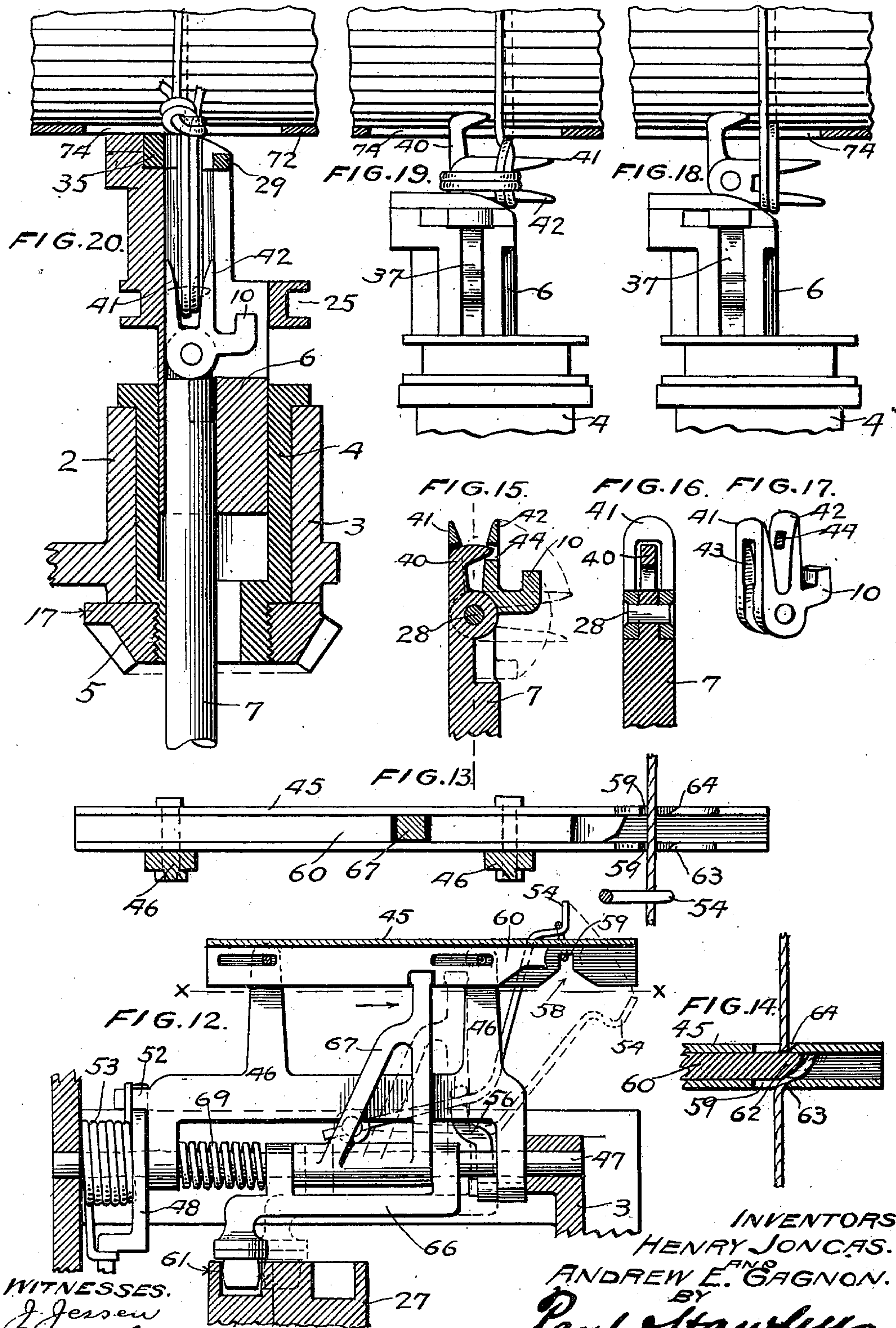
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6 Sheets—Sheet 4.



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FIG. 21.

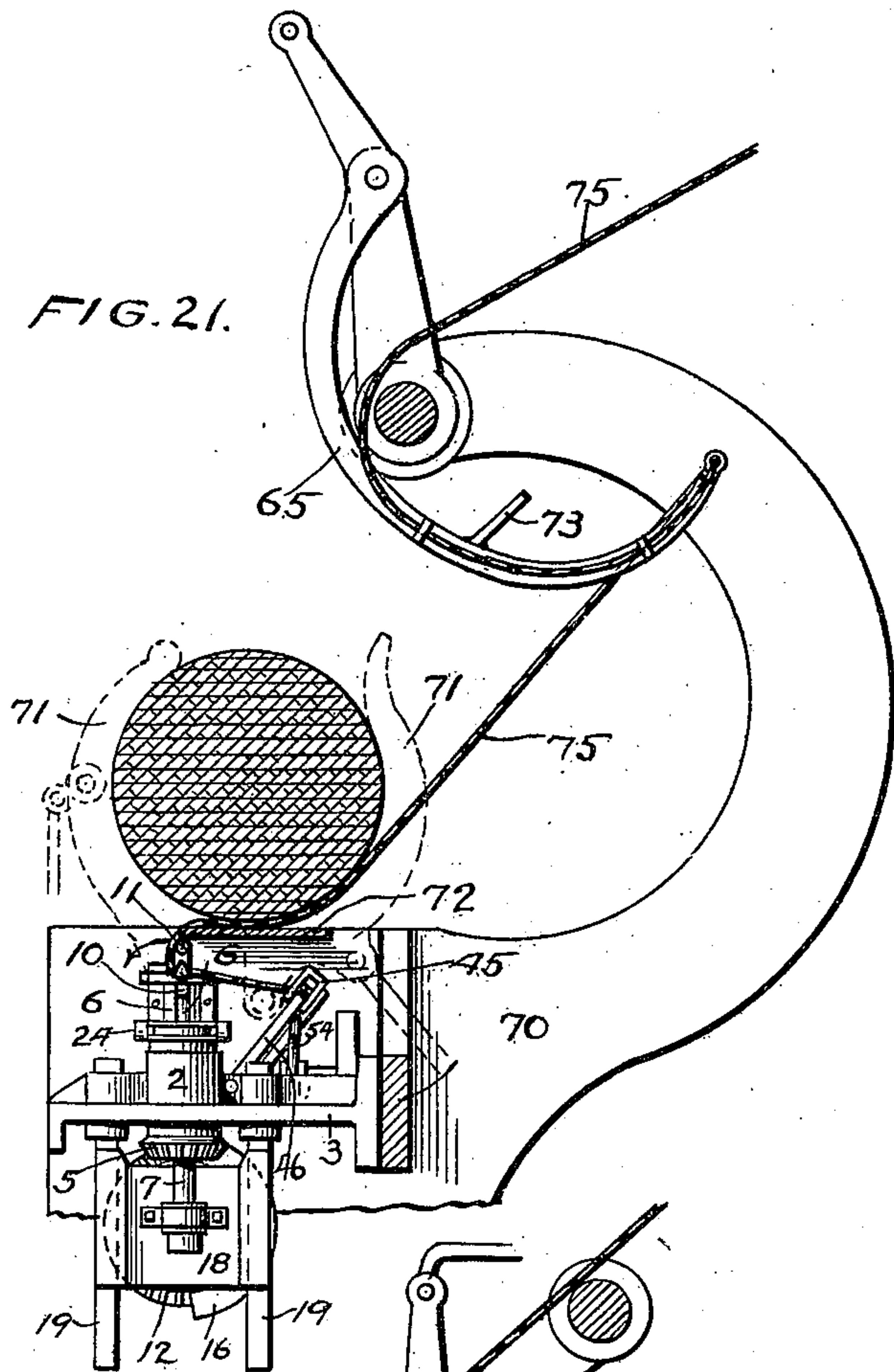


FIG. 22.

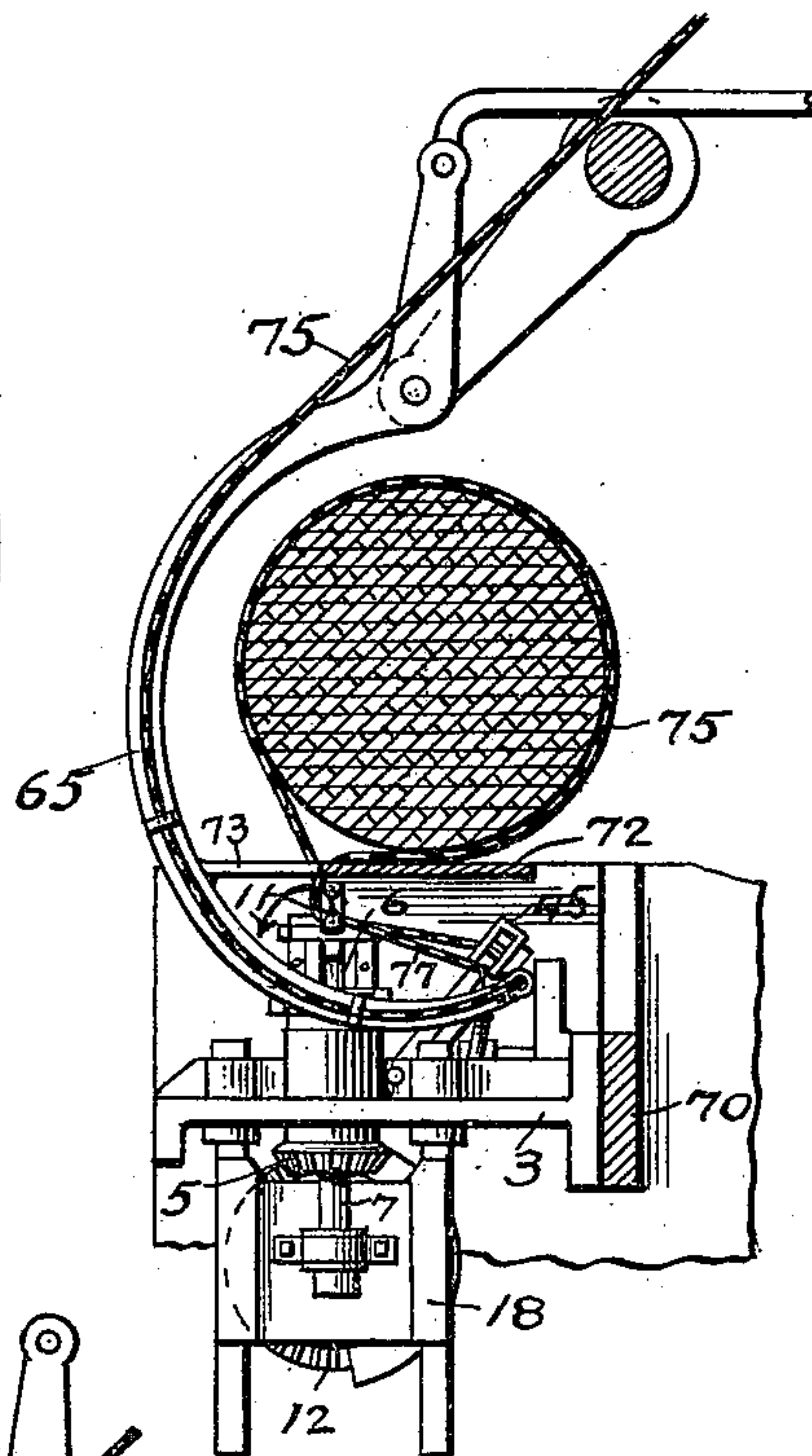


FIG. 23.

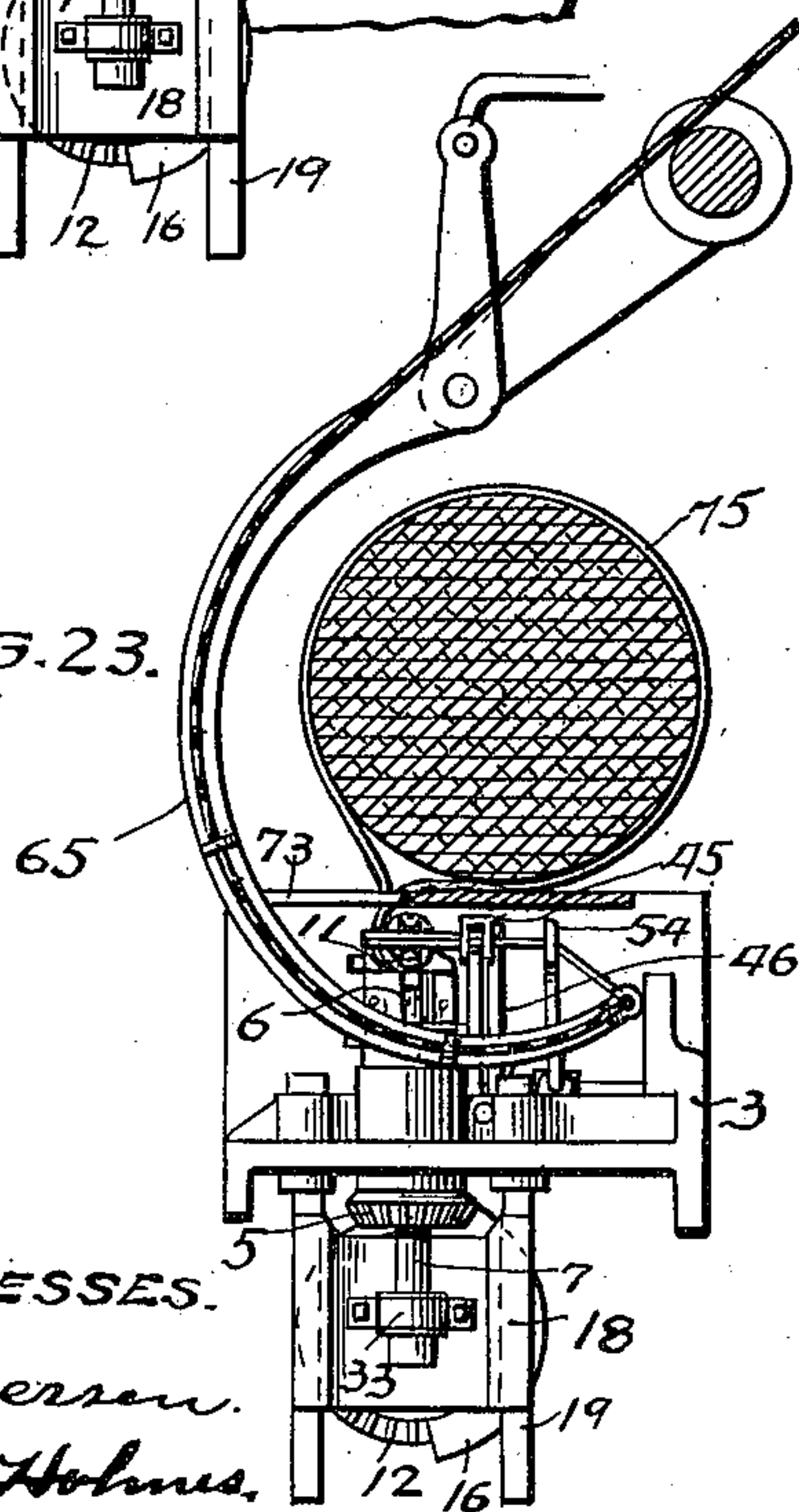
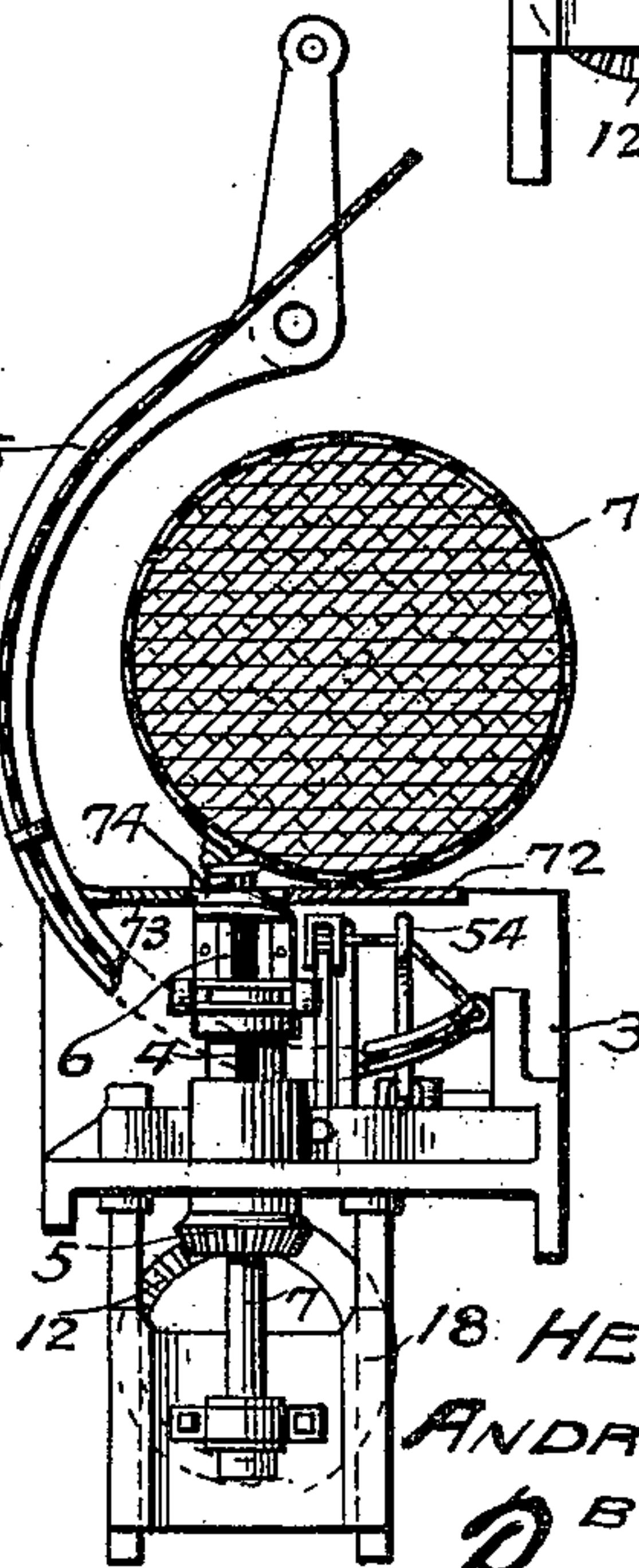


FIG. 24.



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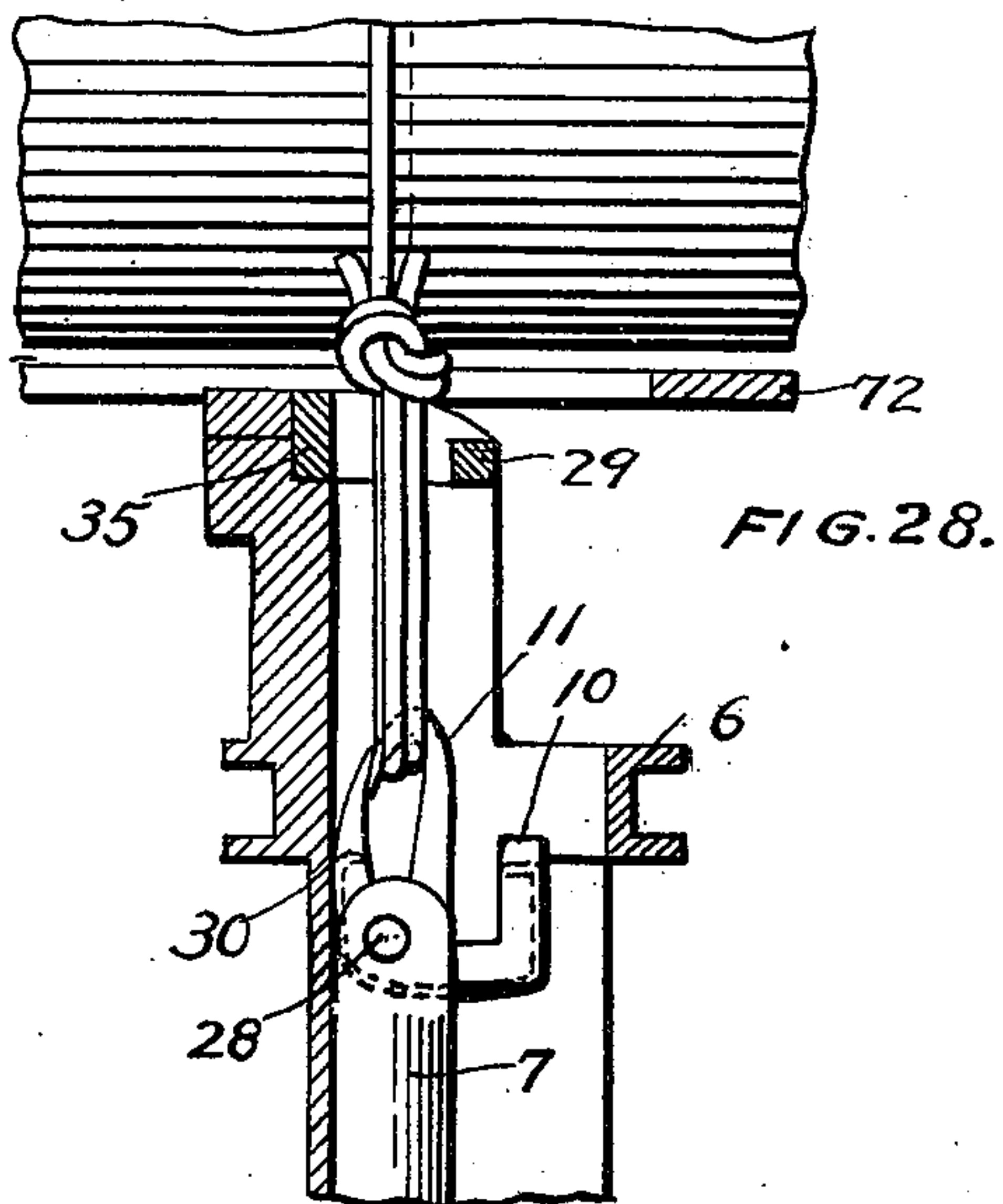
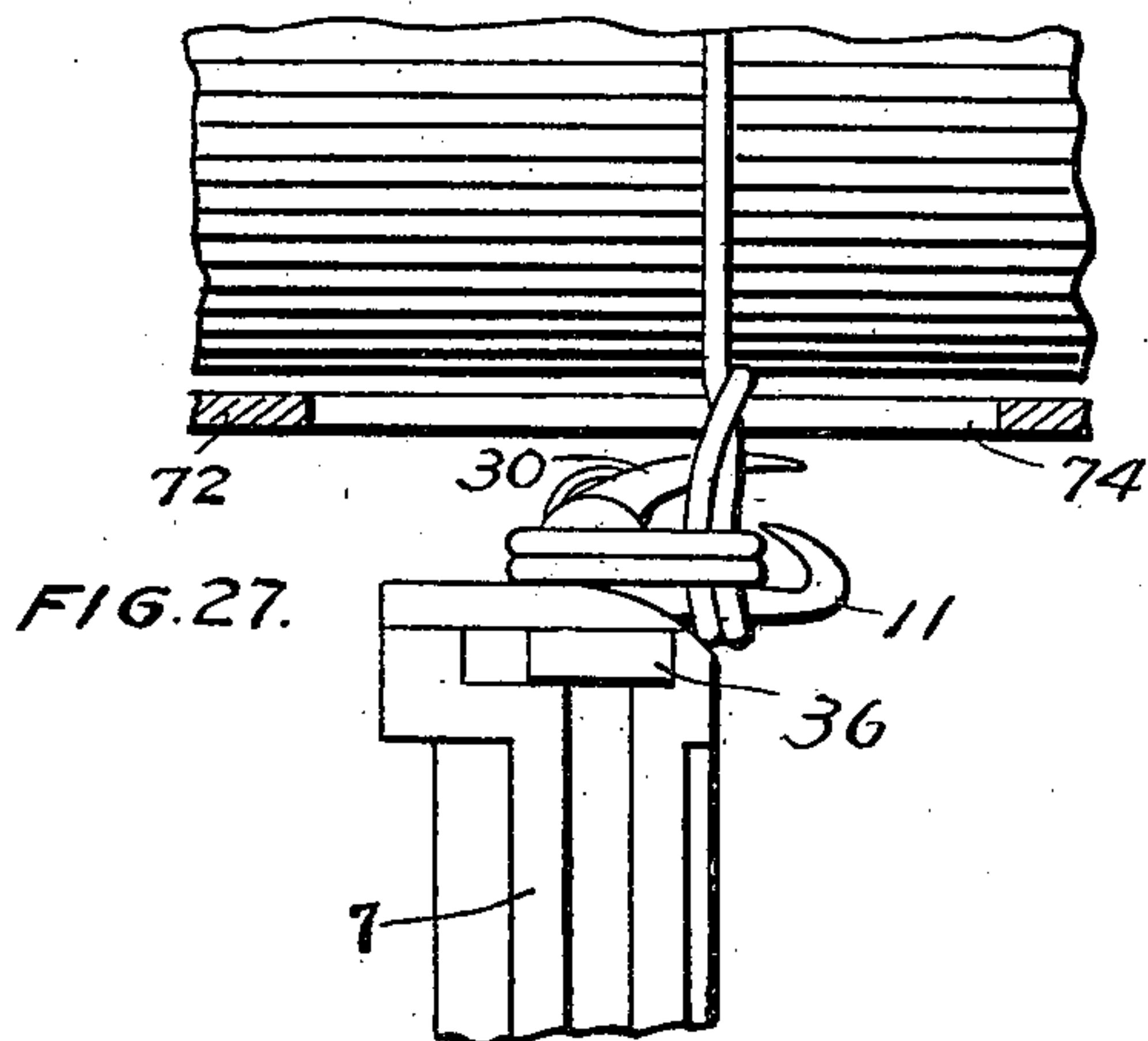
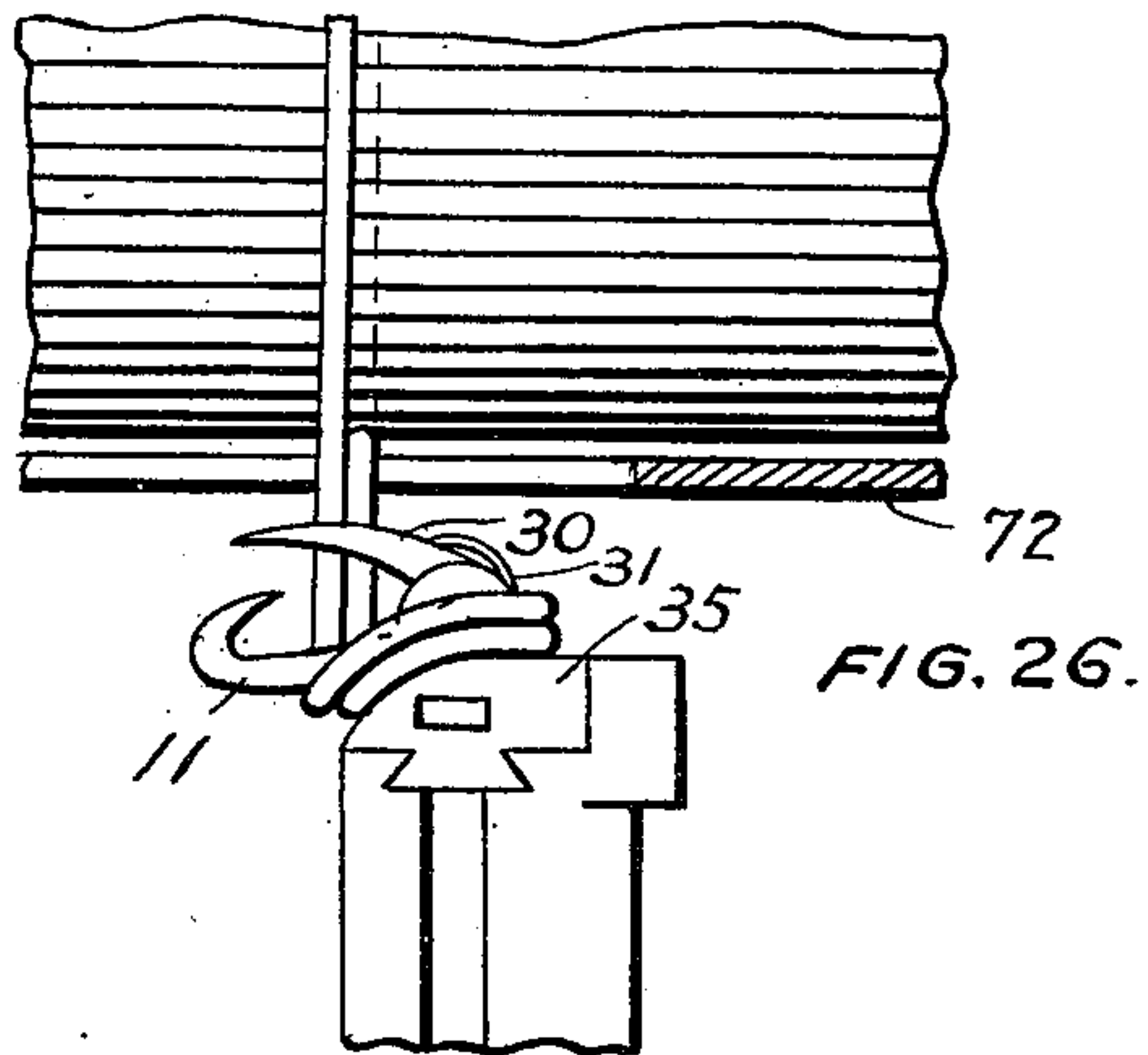
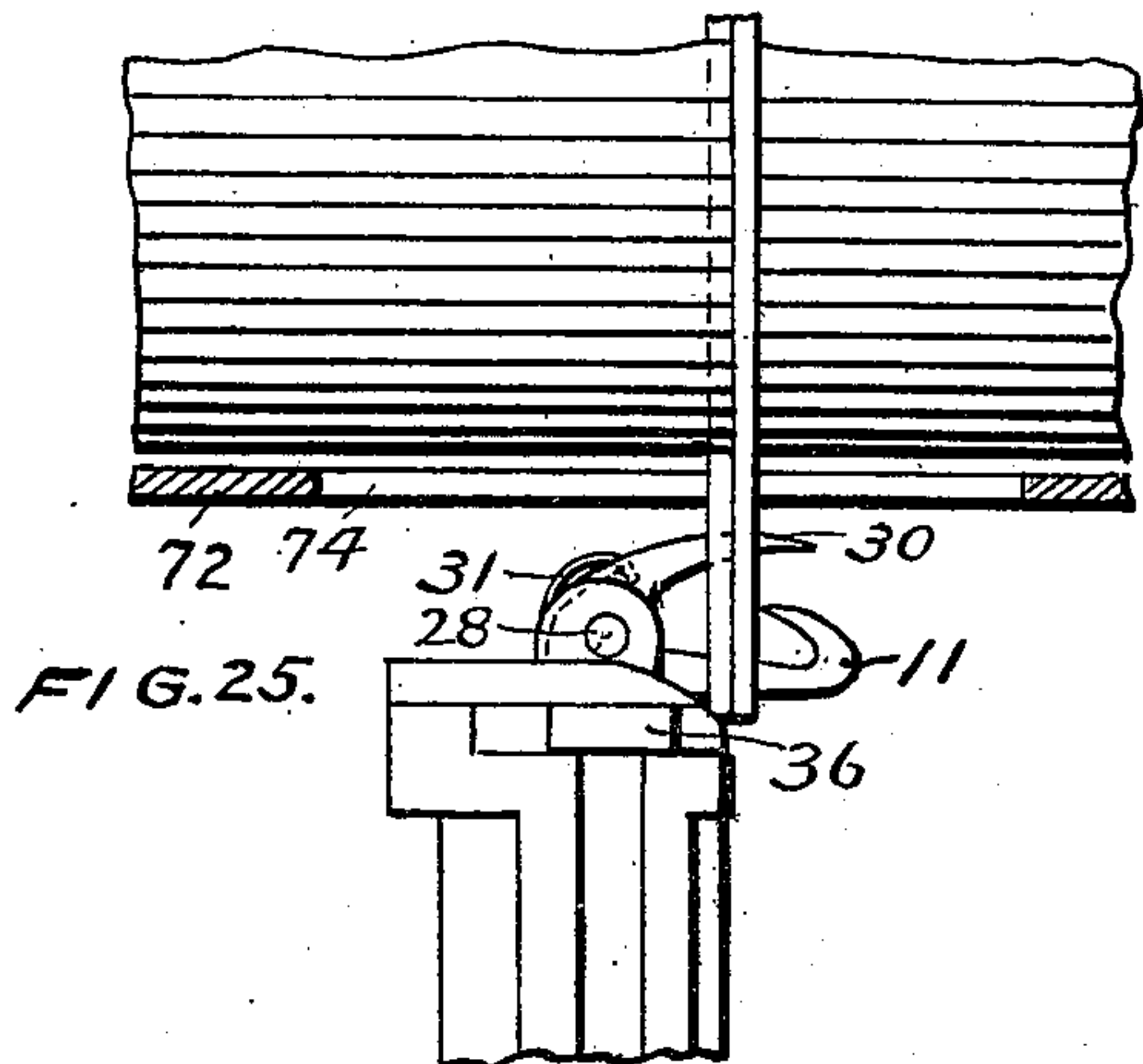
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6 Sheets—Sheet 6.



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SAID JONCAS ASSIGNOR OF PART OF HIS RIGHT TO SAID GAGNON.

KNOTTER FOR BINDERS.

SPECIFICATION forming part of Letters Patent No. 664,253, dated December 18, 1900.

Application filed July 3, 1897. Serial No. 643,335. (No model.)

To all whom it may concern:

Be it known that we, ANDREW E. GAGNON and HENRY JONCAS, of Minneapolis, Hennepin county, Minnesota, have invented certain
5 new and useful Improvements in Knotters for Binders, of which the following is a specification.

Our invention relates to machines for binding laths or like products in wood and also
10 to grain-binders and in general to all machines which wind or bind a cord or band about a bundle and tie a knot with the ends of the cord. There are many machines of this general class and many which satisfactorily perform the service required in binding grain or like compressible stuff which will expand and fill the loop or encircling
15 band; but up to the present time no successful machine for binding such incompressible
20 materials as wood or metal in bars or sticks has been produced to our knowledge.

It is one object of our invention to provide a binder and knotter which, in addition to tying a very tight knot, will draw the cord or
25 band firmly around the bundle and leave the cord under tension before the material is removed from the compressor, which is used to hold the bundle in form while being bound; and it is a further object of our invention to
30 provide such a positive device which, while specially adapted for binding laths in a bundle or bundles or any incompressible article, will by its lightness and compactness of form be equally adapted for use in binding grain
35 and the like and will show a marked improvement in that special branch of the art.

The leading and most definite object of our invention is to provide a knotter which after forming the loop, which may be done in many
40 ways, will hold the ends of the cord and roll or force the untightened knot close up to the bundle and then tighten the knot, placing the cord under tension, and leaving the knot against the bundle so firm and strong that it
45 cannot become untied or loose and open.

Our invention consists in the combination, with suitable means for passing or wrapping the cord or band around a bundle, of means for forming a loop in the cord and for drawing
50 the ends of the cord through the loop to form the untightened knot and a device or

part closing upon the cord on that side of the untightened knot opposite the bundle, the drawing and closing means being relatively
movable to cause the untightened knot to be
55 rolled against the bundle.

Our invention further consists in improved means for tying the knot and for cutting the cord, and, further, our invention consists in particular constructions and combinations of
60 parts, all as hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and
65 in which—

Figure 1 is an end elevation of a knotter embodying our invention. Fig. 2 is a side view thereof in section on the line *xx* of Fig. 1. Fig. 3 is an end section on the line *yy* of
70 Fig. 2. Fig. 4 is a similar section on line *xx* of Fig. 2. Fig. 5 shows the inner face of the sliding cam by which the knotter-hook is moved back and forth intermittently. Fig. 6 is an enlarged longitudinal section of the
75 knotter and knot-drawing mechanism. Fig. 7 is a sectional view of the same on the line *yy* of Fig. 6. Fig. 8 is a sectional detail on the line *zz* of Fig. 7. Fig. 9 is a cross-section on the line *vv* of Fig. 6. Fig. 10 is a
80 cross-section on the line *xx* of Fig. 6. Fig. 11 is a perspective view of the top of the head, showing the plates which close back of the untightened knot. Fig. 12 is a section substantially on the line *xx* of Fig. 4 and
85 illustrating the action of the knife. Fig. 13 is an enlarged bottom view of the knife and the knife-case as seen from the line *xx* of Fig. 12. Fig. 14 illustrates the cutting of the cord. Figs. 15, 16, and 17 are sectional and
90 perspective views illustrating a modified form of the knotter-hook. Fig. 18 illustrates a device illustrated in Figs. 15, 16, and 17 in position ready to tie the knot. Fig. 19 shows the knot tied, but not tightened against the
95 bundle. Fig. 20 is a sectional view showing the hook drawn in, while the pressure-plates hold the untightened knot on the head and force the same against the bundle. Figs. 21, 22, 23, and 24 illustrate four suc-
100 cessive positions of the parts from the beginning of the operation to the completion of the

knot. Figs. 25, 26, 27, and 28 illustrate four successive positions of the knotter and head during the process of forming the knot with the mechanisms illustrated in Figs. 6 and 7.

Referring to the drawings and particularly to Figs. 6 to 11 and in connection therewith Figs. 1 and 2, the machine will be seen to comprise three principal parts—the knotter-head mechanism, the knife mechanism, and the motive shaft, with its cams and gear-wheel. The sleeve 2 upon the base-plate 3 serves as a bearing for the hollow shaft 4, having a gear-pinion 5 upon its lower end and containing the slidable head 6, which head in turn contains the slidable stem or rod 7, which has the hook 11 upon its upper end. The rod 7 is prevented from rotating in the head 6 by the hook at its upper end, and the head 6 is prevented from rotating in the hollow shaft 4 by a key 8. The head is provided with a recess 9 to admit the heel 10 of the hook 11 when it is drawn inward. The head is turned, with the shaft 4, through the medium of the pinion 5 and the gear 12. The gear 12 is secured upon the motive shaft 13, which has suitable bearings 14 and is driven through a gear 15 upon its opposite end. Both the pinion 5 and the gear 12 are mutilated gears, the gear 12 having the same number of teeth as the pinion 5 and having a flange 16 to engage a flap or straight shoulder or face 17 upon the pinion and whereby the pinion is held against rotation during the time the gear is completing its revolution. The shoulder 17 is released before the teeth of the two gears again engage. During the time that the pinion, and hence the head and hook, is being rotated the stem or rod 7 is longitudinally stationary within the head. This is accomplished by means of a sliding cam-plate 18, movable between suitable guides 19, extending from the base 3 and having upon its inner face an irregular groove, (see Figs. 1 and 5,) a portion of which groove 20 is semicircular, and a portion 21 thereof is returned in a V form, the groove having inclined sides. 22 is a pin on the face of the gear-wheel 12 and entering the groove 20. While the gear-teeth are in mesh the pin will move in the semicircular portion of the groove, so that the cam-plate, to which the lower end of the hook rod or stem 7 is attached, will not move; but as the gears pass out of the mesh the pin will move into the straight portions of the groove and pull the plate down during one part of the revolution of the gear-wheel 12 and force it back into position during the remaining part of such movement. 23 is a bell-crank having a yoke 24, provided with lugs extending into the groove 25 in the head 6. The other arm of the bell-crank engages with the side cam 27 upon the shaft 13, and before the hook is drawn down this cam acts to lift the head, this movement being to tilt the hook and make the cord secure therein by closing the hook parts together before the hook is drawn

down into the head. The hook 11 is pivoted upon a pin 28 in the upper end of the rod 7, said upper end being bifurcated to receive the hook. The hook is provided with a heel 10, which is arranged beneath a small cross-bar section 29 of the head, there being sufficient play between said heel and said cross-bar section to permit the heel to swing out under said section when the hook is tilted on its pivot and drawn down into the head. Upon the upstroke of the hook after it has passed out of the head the heel engages the cross-bar 29 and tilts the hook down to a horizontal position, as shown in Fig. 6. 30 is a tongue, also pivoted on the pin 28 and adapted to close upon the hook 11 when it is drawn into the head. A spring 31 holds the tongue or finger 30, but allows the same to yield at the time when the knot is drawn off in removing the bundle from the machine. It will be noted that the rod 7 is eccentrically arranged in the head and the sleeve or shaft by which it is rotated. The rod, however, at its lower end is provided with an offset portion 32, journaled in a block 33 on the cam-plate 18 and concentric with the head. One side of the head is also cut away, the object being to form the knot in a position substantially in line with the axis of the head, so that in turning the head, which is a part of the operation, the cord will simply be twisted and the knot will not be swung around or the string sawed on the bundle. This is a particular feature of our invention, as in the numerous experiments made with knotters not so constructed much annoyance was experienced by the breaking of the cords. One side or corner 34 of the head is beveled, so that the string will slide up onto the top of the head easily and from thence into the hook just as the revolution is completed. In the head are two transversely-slidable plates 35 and 36, one being preferably within the other and adapted to close together on that side of the untightened knot opposite the bundle when the hook is drawn down. Their movement is accomplished by means of the short levers 37 entering slots 37' therein, as shown in Fig. 7, and pivoted in the head upon pins 38. The opposite or lower ends of the levers project into grooves 39 in the sides of the hook rod or stem 7. The bottoms of these grooves are parallel for a distance, so that the plates 35 and 36 are held stationary until the hook passes beneath them. The bottoms of the upper parts of the grooves are inclined, so that the final movement of the stem causes the spreading of the lower ends of the levers and the pressing together of the plates 35 and 36 to retain the knot upon the top of the head, instead of drawing it back into the head with the hook, and as the head moves up it rolls or forces the loose or untightened knot against the bundle to be tightened thereon by the hook drawing down the ends of the cord.

A modified and, we think, a better form of knotter-hook is illustrated in Figs. 15 to 20,

inclusive. The other parts of the device remain the same. This hook comprises a fixed hook 40 upon the upper end of the rod 7 and a tilting part comprising two fingers 41 and 42, provided, like the other device, with a heel 10, by which the fingers are swung from one position to the other. The finger 41 is provided with a slot 43 to admit the hook 40, and the finger 42 has an opening 44 to admit the point of the hook, as shown in Fig. 15. When the two strands of the cord have been drawn in between the two fingers, the fingers are tilted and said strands will be bound between the hook 40 and the finger 42, and obviously cannot escape therefrom so long as the hook is drawn down into the shaft-hole in the head.

The knife or cutting mechanism will be best understood by reference to Figs. 3, 4, and 12. The knife guide or case 45 is secured upon the frame 46, which is pivoted upon a fixed shaft or rod 47, secured in the base and parallel with the shaft 13. This frame is automatically swung toward the hook of the knotter by a lever 48, engaged with a crank-pin 49 on the disk 50. The pin is made adjustable by setting it upon an independent adjustable plate 51. The lever 48 is pivoted on the rod 47, and at its opposite end engages with a lug 52 on the knife-frame 46. The frame is held upon the lever by a strong tension-spring 53, which, however, permits the knife-frame to leave the lever in case it is necessary to equalize the strain or tension upon the cord by allowing the frame to yield and draw up toward the head without being positively moved to such position by the lever. The movement to the positions shown in Fig. 3 by dotted lines is made to bring the knife into position to catch the cord from the finger of the binder, and the cord is positively moved into line by means of a small finger 54, pivoted on the stud 55 and connected by a link 56 to the knife-frame, (see Fig. 12,) whereby the movement of the finger is at all times commensurate with that of the knife-frame to carry the cord into the notch 58 in the guard or case 45. The deeper portion 59 of this notch is intersected by the knife 60, which is a bar slidable in the case 45 and reciprocated therein by the side cam 61. The end of the knife is beveled or rounded, as shown at 62 in Fig. 14, and the lower shoulder 63 of the notch 59 is also beveled to prevent the cutting of the cord between the bottom of the knife and the case. The upper edge of the knife is sharp, and the cord is cut between the same and the shoulder 64 of the notch in the upper part of the case or guide. At the moment the cord between the bundle and the binder-arm 65 is moved into the notch 59 by the finger 54 the knife is drawn back by the action of the cam 61, acting through the sliding frames 66 and 67, which frames or arms are independent to permit the tilting or swinging of the knife-frame. At the next instant, just before the head of the knotter is lifted, the arm 66 in engagement with the

cam 61 will drop over the abrupt shoulder 68, and the knife will be forcibly shot back to cut the string by the spring 69, coiled on the rod 47, said arm 66 being held from turning on the shaft 47 by a pivoted link 66'. The free end of the cord, with that before liberated by drawing back the knife, may then be drawn through the loop, while the end of the cord in the binder-arm will be caught and held in the knife-case, as shown in Fig. 14.

The complete operation of our machine will be well understood by reference to Figs. 21 to 24. The base-plate 3 is secured to the frame 70 of the bundling and binding machine. The machine partially illustrated in Fig. 21 is a lath-binder and is provided with compressor-arms 71, (see dotted lines,) which compress and form the bundle preparatory to the wrapping of the cord about the end thereof. 72 is a guard-plate and cord-guide which overhangs the knotter-head, and the needle-arm 65 is provided with a guard-plate 73, which as the arm is carried around beneath the bundle will abut against the edge of the plate 72. The two plates are provided with notches 74, which form a hole in which the string is guided and held opposite the knotter-hook and in line with the axis of the head. The string or cord 75 is taken from a suitable tension roll or bobbin (not shown) and is threaded in the needle-arm 65 and through the eye therein. From thence it is carried downward and over the edge of the plate 72 and thence past the hook and back to the knife-casing 45, in which it is secured. The bundle or bunch of laths or other articles is then put in place, whereupon the machine is ready to start and will thereafter operate automatically. When the machine is started, the needle-arm 65 will swing forward over the top of the bundle and then downward and around beneath the same into the position shown in Figs. 22, 23, and 24. The needle-arm remains in this position until the bundle is tied and removed. The downward movement of the needle-arm forms a loop around the bundle with both ends or strands of the loop caught upon the forward side of the hook. At this time the head 6 receives one complete revolution from the gear 12 and in the direction shown by the arrows in Figs. 21 and 22. The ends 77 of the loop are carried up onto the top of the head by the rounded corner thereof when the head is turned and are wrapped about the hook over the two loops which are on the side thereof. The ends of the cord drop into the space between the two fingers of the hook, the knife-frame and the finger 54 having meantime been raised to the position shown in Fig. 23 to carry the strands of the cord into the knotter and prepare the continuous strand thereof to be severed in the knife. Next follows the operation of the knife, the same being drawn back by the cam 68, and after the string is cut, with a new end left in the knife, the head 6 is raised by the lever 23 to roll the loop or unfinished knot against the bundle,

thereby tilting the hook and closing the jaws thereof to confine the ends of the cord therein. The ends of the cord are gripped so firmly that they will not slip in the hook, and with the head still raised to hold the unfinished knot close to the bundle, as shown in Fig. 24, the rod 7 and the hook are drawn down into the head to tighten the knot and the cord upon the bundle. The hook is then returned and the head dropped to open the hook and free the ends of the cord therefrom. The bundle may then be removed from the machine. After the return of the needle-arm, which follows, the machine is prepared to receive and bind the next bundle.

It is obvious that various modifications of our invention will readily suggest themselves to one skilled in the art, and we therefore do not confine the same to the specific construction herein shown and described.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination, with means for passing a cord around the bundle, of means for forming a loop in the cord, means for drawing the ends of the cord through the loop to form the untightened knot, a device to close upon the cord below the untightened knot and said drawing means and said device being relatively movable, to permit the untightened knot to be rolled against the bundle and tightened with the cord thereon.

2. The combination, with means for passing a cord around the bundle, of means for forming a loop in the cord, means for drawing the ends of the cord through the loop to form the untightened knot, and means to clasp the cord on that side of the untightened knot opposite the bundle and said drawing and clasping means being relatively movable to cause the untightened knot to be rolled against the bundle and tightened with the cord thereon, substantially as described.

3. The combination, with means for placing a cord or band upon a bundle, of means for forming a loop in the cord, means for drawing the ends of the cord through the loop so formed to form the untightened knot, and means for closing upon the cord, said drawing and closing means being relatively movable to roll the untightened knot against the bundle in the plane of the cord thereon, substantially as described.

4. The combination, in a knotter, of means for forming the untightened knot, with a head and means thereon to close upon the cord on that side of the untightened knot opposite the bundle and hold the untightened knot with relation to the bundle, and means for moving said knot-forming means with respect to the bundle to draw the ends of the cord and tighten the knot and the cord thereon.

5. The combination, in a knotter, with the loop-forming device, and means for drawing the ends of the cord through the loop to form an untightened knot, a head, means thereon

to close upon the cord on that side of the untightened knot opposite the bundle, and means to reciprocate said head and said drawing means in opposite directions to roll the untightened knot toward the bundle and tighten it and the cord thereon, as and for the purpose specified.

6. The combination, with a knotter, of means to close about the cord on that side of the knot opposite the bundle, and means to draw back the knotter to roll the loop and complete and tighten the knot and cord, substantially as described.

7. The combination, with the knotter, of a head, and means connected therewith to close upon the cord and roll the untightened knot toward and hold it against the bundle, and means to reciprocate the knotter to tighten the knot upon the bundle in the plane of the cord.

8. The combination, with a knotter for forming a loop in the cord and drawing its ends through the loop to form the untightened knot, of a head having means to close upon the cord on that side of the untightened knot opposite the bundle, and means operating the knotter to draw upon the ends of the cord and tighten the knot against said closing means, substantially as described.

9. The combination, in a knotter, with the loop-forming device, of a hook to draw the ends of the cord through the loop to form the untightened knot, closing means engaging the cord on that side of the untightened knot opposite the bundle, and means to reciprocate said closing means and said hook with respect to one another to roll and tighten the knot against the bundle in the plane of the cord thereon, substantially as described.

10. The combination, in a knotter, with a hook and means cooperating therewith to form the untightened knot, of means for reciprocating said hook, a head, and means in connection therewith to close upon the cord on that side of the untightened knot opposite the bundle and hold the untightened knot when the hook is reciprocated to tighten it, substantially as described.

11. The combination, in a knotter, with a hook and means cooperating therewith to form the loop and the untightened knot, of means to close the hook device upon the ends of the cord, means for reciprocating the hook device, a head, and means thereon closing upon the cord on that side of the untightened knot opposite the bundle to hold the knot against the same as the ends of the cord are drawn to tighten it.

12. The combination, in a knotter, with the loop-forming device and the hook coacting to form the untightened knot, of means for closing the loop-forming device upon the hook to secure the cord, means for moving the hook to draw upon the cord and the untightened knot formed therein and means closing upon the cord below the untightened knot during said drawing movement of the hook, whereby

the knot is finally rolled against and tightened upon the bundle, substantially as described.

13. The combination, in a knotter, with a 5 loop-forming device and a hook cooperating to form the untightened knot, a head rotated therewith, means for reciprocating said head, said loop-forming device being adapted to be tilted by the movement of said head, means 10 upon said head closing upon the cord below the untightened knot and means for drawing said hook into said head, substantially as described.

14. The combination, with the tilting knot- 15 ter, of a knotter-head, said parts rotating together, means to reciprocate the head and tilt said knotter, said head having an opening to accommodate said knotter, and means for drawing the knotter back into said opening, 20 as and for the purpose specified.

15. The combination, with the knotter adapted to tilt and engage the cord, of a movable head to tilt the knotter and having a 25 part to engage the loose or untightened knot formed thereby, and means for drawing the knotter back to complete and tighten the knot held by said head substantially as described.

16. The combination, with an intermittently-rotated head, of a hook adapted to be re- 30 ciprocated therein and in its outer position to engage the cord and aid in forming a loose knot therein, means to reciprocate said head, and means thereon closing upon the cord on 35 that side of the untightened knot opposite the bundle to roll or force the knot against the bundle, for the purpose set forth.

17. The combination, with a suitable head, of a knotter, means for drawing the knotter 40 into the head, and a transversely-movable part or parts to hold the loose or untightened knot upon the end of the head, substantially as described.

18. The combination, with a suitable head, of a knotter, means for drawing the knotter 45 into the head, and a transversely-movable part or parts to hold the loose or untightened knot on the end of the head, and said part or parts being operated by the movement of said knotter, substantially as described.

50 19. In a knotter, the combination with the stem provided with a hook 40, of pivoted fingers 41 and 42 having openings to receive said hook, substantially as described.

20. The combination, with the head, of the 55 stem provided with the hook 40 and carrying the pivoted fingers 41 and 42 adapted to close upon said hook to confine a cord between a hook and the fingers, and said fingers provided with a heel operating upon the head to 60 swing the fingers from one position to the other, substantially as described.

21. The combination, with the stem or rod 7, provided with a hook 40 and with the pivoted fingers coacting therewith to grasp and 65 secure the cord, of means for rotating said stem and for reciprocating the same, as and for the purpose specified.

22. A knotter for lath-binding machines, comprising a head, means for rotating the same, a hook, a loop-forming device, whereon 70 the cord is wound, means for raising said head, means carried by said head to close on the cord on that side of the untightened knot opposite the bundle, and means for drawing 75 down the hook and the ends of the cord into the head, substantially as described.

23. In a knotter for lath-binders, a head, means thereon closing upon the cord on that side of the untightened knot opposite the bundle, a stem eccentrically arranged within said 80 head parallel with the axis thereof, a hook provided on said stem and a cam device for operating said stem and whereby the same is drawn down into the head to complete and 85 tighten the knot against said engaging means and then raised to release the ends of the cord, substantially as described.

24. In a knotter for lath-binders, a rotating head, a reciprocating stem therein and means 90 for operating the same, a hook provided on said stem, clamping means carried by said head to close upon the cord upon that side of the untightened knot opposite the bundle and means actuated by the downward movement 95 of said stem to operate said clamping means, substantially as described.

25. A knotter for lath-binding machines, comprising a vertically-movable head and means for operating the same, a reciprocating stem within said head, a hook and fingers pro- 100 vided on said stem, and clamping devices carried by said head and operated by the downward movement of said stem to clamp the cord on that side of the untightened knot opposite 105 the bundle while the stem draws down the ends of the cord, substantially as described.

26. A knotter for lath-binders, comprising a head, a reciprocating stem therein and means for operating the same, a hook pro- 110 vided on said stem, clamping-plates provided on said head and levers pivoted in said head and having their upper ends in engagement with said plates and their lower ends in en- 115 gagement with said stem, substantially as described.

27. In a knotter for lath-binders, the combination, with a rotating head and means for operating the same, of a reciprocating stem carried by said head, a hook provided on said stem, clamping-plates 35 and 36 carried by 120 said head and adapted to clamp the cord on that side of the untightened knot opposite the bundle, levers 37 pivoted in said head having their upper ends in engagement with said plates and their lower ends fitting grooves in 125 said stem whereby when said stem is operated to draw the ends of the cord through the loop said plates will be operated to engage the cord and roll or force the untightened knot closely 130 against the bundle.

28. A knotter for lath-binding machines, comprising a head having a revoluble support, said head being vertically movable in and also revoluble with said support, a recip-

rocating stem arranged within said head and rotatable with but not independently thereof, means for operating said head and said stem, a hook on said stem and said stem being arranged eccentrically with respect to said head whereby the knot is formed substantially in line with the axis of said head, as and for the purpose specified.

29. In a knotter for lath-binders, a head, reciprocating jaws to close upon the cord between the loose or untightened knot and said head, a stem eccentrically arranged within said head parallel with the axis thereof, a hook provided on said stem and a cam device for operating said stem and whereby the same is drawn down to complete and tighten the knot against said jaws and then raised to release the ends of the cord, substantially as described.

30. In a knotter for lath-binding machines, the combination, with a sleeve, of a hollow shaft therein provided with a pinion 5 having a delay-surface 17, a head 6 supported within said shaft, a vertically-movable stem in said head, a shaft 13, a gear 12 thereon having teeth to engage the teeth of said pinion 5, and a flange 16 to engage said delay-surface 17, substantially as described.

31. In a knotter for lath-binders, a hollow shaft and means for rotating the same, a head within said shaft and rotatable therewith and having its upper part on one side cut away, a reciprocating stem within said head and rotatable therewith, means for operating said stem, a knotter-hook provided on said stem, said stem being eccentrically arranged with respect to said head, whereby when said head is turned the knot will be formed substantially in line with the axis of said head, substantially as described.

32. In a knotter for lath-binding machines, a head, a stem vertically movable therein and whereon the hook is arranged, said stem being provided at its lower end with an offset portion 32, a sliding cam-plate 18, a block 33 wherein said offset portion is journaled, and means for operating said cam-plate, substantially as described.

33. In a knotter for lath-binding machines, a shaft 47, a frame 46 thereon, means for swinging said frame, a knife-case 45 supported by said frame, a knife carried by said case, a frame 66, a frame 67 engaging said knife and said frame 66, and means for sliding said frame 66 to operate said knife, substantially as described.

34. In a knotter for lath-binding machines, a cutting mechanism comprising a case, a knife mounted therein, a frame or arm 67 in engagement with said knife, a second frame 66, a shaft 47 whereon said frames are mounted, and a cam 61 in engagement with said frame 66 whereby said frames will be moved in one direction upon said shaft, and a spring 69 for moving said frames and said knife in the opposite direction, substantially as described.

35. In a knotter for lath-binding machines, a cutting mechanism comprising a swinging frame and means for operating the same, a knife carried thereby, means for reciprocating said knife, a pivoted finger 54 and a suitable connection between said finger and said frame, substantially as described.

36. In a knotter for lath-binding machines, a knife-cutting mechanism comprising a swinging frame, means for operating the same, a knife-case carried thereby having a notch 58, a knife provided in said case, means for reciprocating said knife, a pivoted finger 54 adapted to engage the cord from the binder and carry it into said notch 58 and means connecting said finger with said frame, substantially as described.

In testimony whereof I have hereunto set my hand this 28th day of May, A. D. 1897.

ANDREW E. GAGNON.

In presence of—

C. G. HAWLEY,

A. F. HOLMES.

In testimony whereof I have hereunto set my hand this 17th day of June, A. D. 1897.

HENRY JONCAS.

In presence of—

E. W. LYNCH,

OLE HENNING.